

New data on the genus *Malgasia* (Orthoptera: Mogoplistidae) from Madagascar and Seychelles

Новые данные по роду *Malgasia* (Orthoptera: Mogoplistidae) с Мадагаскара и Сейшельских островов

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Malgasia marmorata (Saussure, 1899) is redescribed on the base of the type specimens and new material. Three new species from Seychelles and Madagascar, *M. seychellensis* sp. nov., *M. minutissima* sp. nov. and *M. grisea* sp. nov. are described.

Malgasia marmorata (Saussure, 1899) переописан на основании типовых экземпляров и нового материала. Три новых вида, *M. seychellensis* sp. nov., *M. minutissima* sp. nov. and *M. grisea* sp. nov., описаны с Сейшельских островов и Мадагаскара.

Key words: crickets, taxonomy, Seychelles, Madagascar, Orthoptera, Mogoplistidae, Malgasiinae, *Malgasia*, new species

Ключевые слова: сверчки, таксономия, Сейшельские острова, Мадагаскар, Orthoptera, Mogoplistidae, Malgasiinae, *Malgasia*, новые виды

INTRODUCTION

The genus studied was described as *Voeltzkowia* together with its type species, *V. marmorata* from the Nosy Be Island near Madagascar (Saussure, 1899). In this paper, *Voeltzkowia* was included in “tribus Acanthii” which is evidently a misspelling of Saussure’s tribe Oecanthii. This generic name is a homonym of *Voeltzkowia* Boettger, 1893 (Reptilia). In this connection, the genus was renamed *Malgasia* (Uvarov, 1940). Chopard (1968) considered it as a member of the subfamily Phalangopsinae (Gryllidae), but Gorochov (1984) indicated that the *Malgasia* male genitalia are very different from those of all the true subfamilies of Gryllidae, and that the partly sclerotized genitalia in *Malgasia* and in Gryllidae are independently developed from the completely membranous genitalia probably

presented in the common ancestor of Gryllidae and *Malgasia*. Also he described the new subfamily Malgasiinae and tentatively included it in Myrmecophilidae, because this subfamily has similarity to Bothriophylacinae, one of the subfamilies of Myrmecophilidae, in the general appearance (including the characteristic structure of the eyes – with their upper part lacking ommatidia) and some other characters (Gorochov, 1984).

Later Myrmecophilidae and Mogoplistidae were united into a separate phylogenetic branch named Mogoplistoidea, but the position of Malgasiinae near Myrmecophilidae (but not near Mogoplistidae) was preserved, as in the paper by Gorochov (Desutter, 1987). One of the first molecular phylogenetic studies showed that Desutter’s union was erroneous, as Mogoplistidae is more related to Gryllidae than to Myr-

mecophilidae, but a certain relationship of Malgasiinae and Mogoplistidae occasionally arising in Desutter's phylogenetic scheme was supported (Jost, Naskrecki, 2003). The latter relationship was also supported by an interesting find in the Burmese amber: the general appearance of *Protomogoplistes asquamosus*, described from this Cretaceous resin (Gorochov, 2010), is almost as in the true representatives of recent Mogoplistinae, but the characteristic scales, covering the body in this subfamily, are absent (as in Malgasiinae). For this fossil, the subfamily Protomogoplistinae was described in the same publication. Thus, the family Mogoplistidae is now divided into three subfamilies: Protomogoplistinae (Cretaceous, Burma), Mogoplistinae (Eocene, USA and Europe; Miocene, Dominican Republic; Recent, almost all tropical and subtropical regions), Malgasiinae (Recent, Madagascar and nearest islands).

The material studied, including the types of three new species, is deposited in the following institutes: Zoological Institute of the Russian Academy of Sciences, Saint Petersburg (ZIN); Forschungsinstitut Senckenberg, Frankfurt am Main (FIS); Natural History Museum, London (NHM).

DESCRIPTIONS OF TAXA

Subfamily MALGASIINAE

Gorochov, 1984

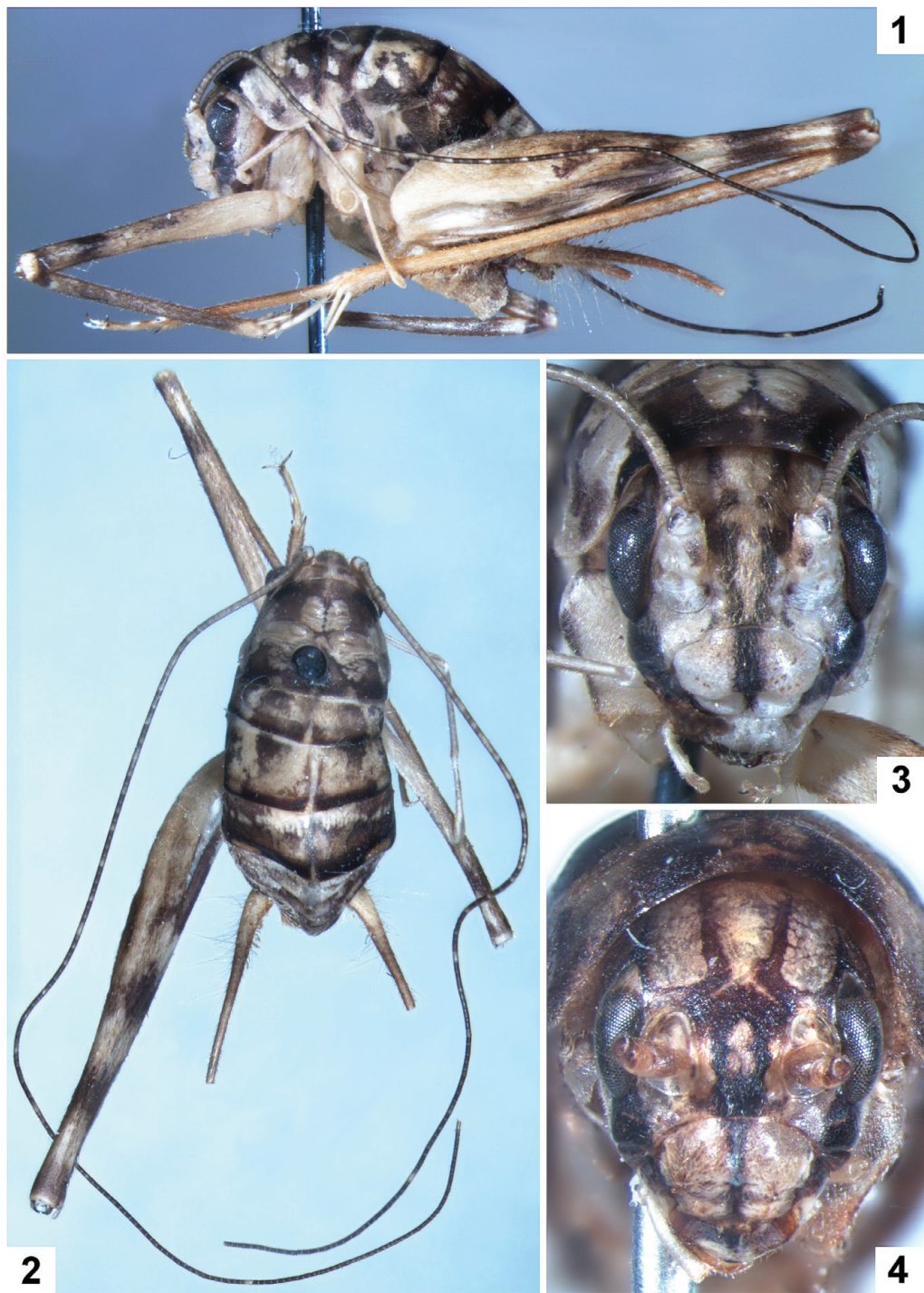
Genus *Malgasia* Uvarov, 1940

Malgasia marmorata (Saussure, 1899)

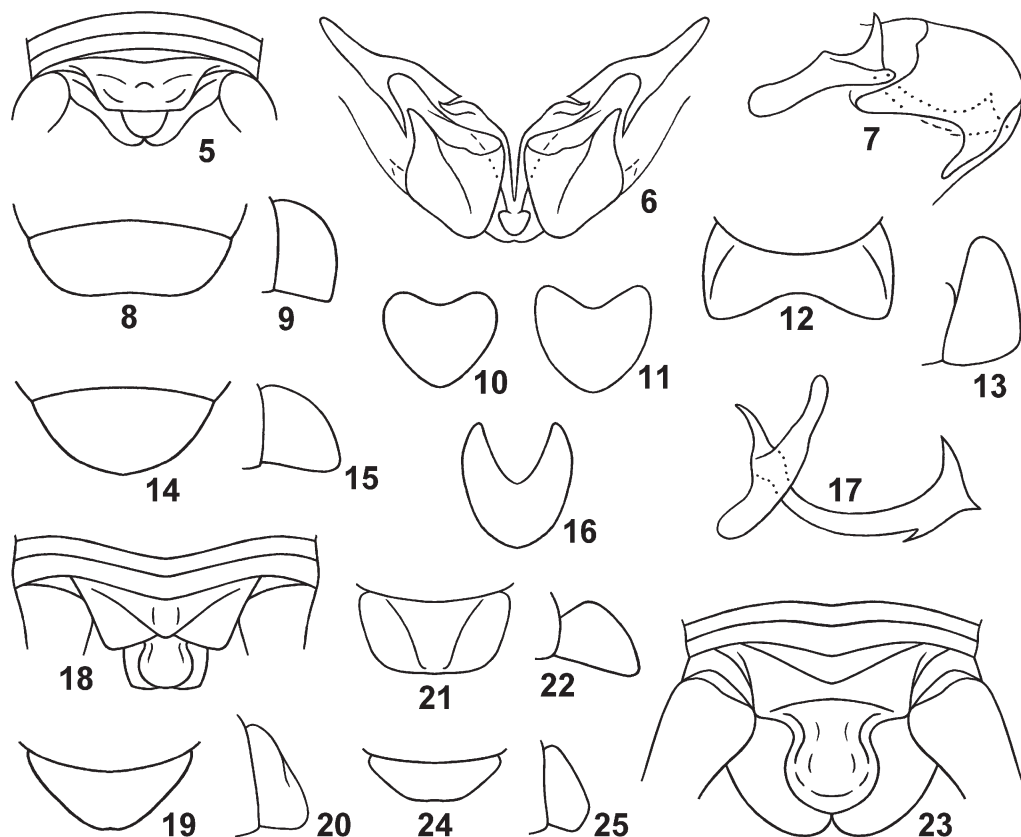
(Figs 1–3, 5–13, 26–29)

Material examined. One male (paratype), 1 female (holotype), 1 nymph (paratype); **Nosy Be I.** [near Madagascar], “Nossi Bé Voeltzkow”, “*Voeltzkowia marmorata* ...”, “Saussure determ.” (FIS). One male, **Madagascar**, Toamasina Prov., Moramanga Distr., Andasibe Vill., 11.II–7.III.2013, D. Edmonds (ZIN); 3 nymphs, same province and district, Analamazaotra Forest Station near Andasibe Vill., 18°56'S, 48°25'E, 900 m, from fodder crop for artificial breeding frogs, 11–28.II.2013, A. Gorochov, L. Anisyutkin (ZIN).

Brief redescription. Completely apterous and lacking tympana species with characteristic appearance. Body medium-sized for *Malgasia*, light (yellowish/whitish) with distinct brown and brownish grey spots on head, on all tergites, on epiproct, on paraprocts, on some pleurites, and on legs (Figs 1–3). Head high; eyes rather large (almost equal to scape in width); rostrum between antennal cavities short (weakly developed), widely rounded in profile, almost equal to scape in width (Figs 1, 3); clypeus transverse, strongly convex and with a short (narrow) lower part (Figs 1, 3); eyes with small (narrow) upper part lacking ommatidia; maxillary palpi very long (Fig. 1). Pronotum slightly transverse, 1.2 times as wide as long, laterally shortened, with convex anterior and posterior edges of disc as well as rounded ventral part of lateral lobes (Figs 1, 2); these disc and lobes practically not separated from each other. Legs (Figs 1, 2) very long and narrow but with barely widened proximal halves of fore and middle femora and distinctly thickened proximal half of hind femora; hind tibiae with two rows of dorsal denticles; apical part of all tibiae with rather long articulated spurs (fore and middle tibiae with a pair of medium-sized ventral spurs; hind tibia with very long middle inner spur (slightly longer than half of hind basitarsus, in male at least) as well as with short ventral outer spur and medium-sized four other spurs). Rest of body rather compact, with pterothoracic and abdominal tergites more or less similar to each other; however last tergite having distinct but short and truncate (at apex) posterior lobe in male (Fig. 5), and somewhat smaller and slightly more rounded one in female; male and female genital plates as in Figs 8, 9, 12, 13. Male genitalia consisting of one V-shaped sclerite, having a pair of dorsal hooks and characteristic apex, and of a pair of large semisclerotized plates on distal part (Figs 6, 7, 10, 11, 26–29); ovipositor long, almost as long as hind femur, and with apical part typical of this genus.



Figs 1–4. *Malgasia*, male: 1–3, *M. marmorata* (Sauss.) from Andasibe Vill.; 4, *M. seychellensis* sp. nov., holotype. Body from side (1) and from above (2); head in front (3, 4).



Figs 5–25. *Malgasia*: 5–13, *M. marmorata* (Sauss.), paratype (5–8, 10) and holotype (12, 13); 14–17, *M. seychellensis* sp. nov., holotype; 18–22, *M. minutissima* sp. nov., holotype (18–20) and paratype (21, 22); 23–25, *M. grisea* sp. nov., holotype. Abdominal apex of male (5, 18) and female (23) from above and somewhat behind; male genitalia from above (6) and from side (7); female genital plate from below (8, 14, 19) and from side (9, 15, 20); apical disc of dorsal sclerite in male genitalia from behind and slightly above (10, 11, 16); this sclerite from side (17); female genital plate from below (12, 21, 24) and from side (13, 22, 25).

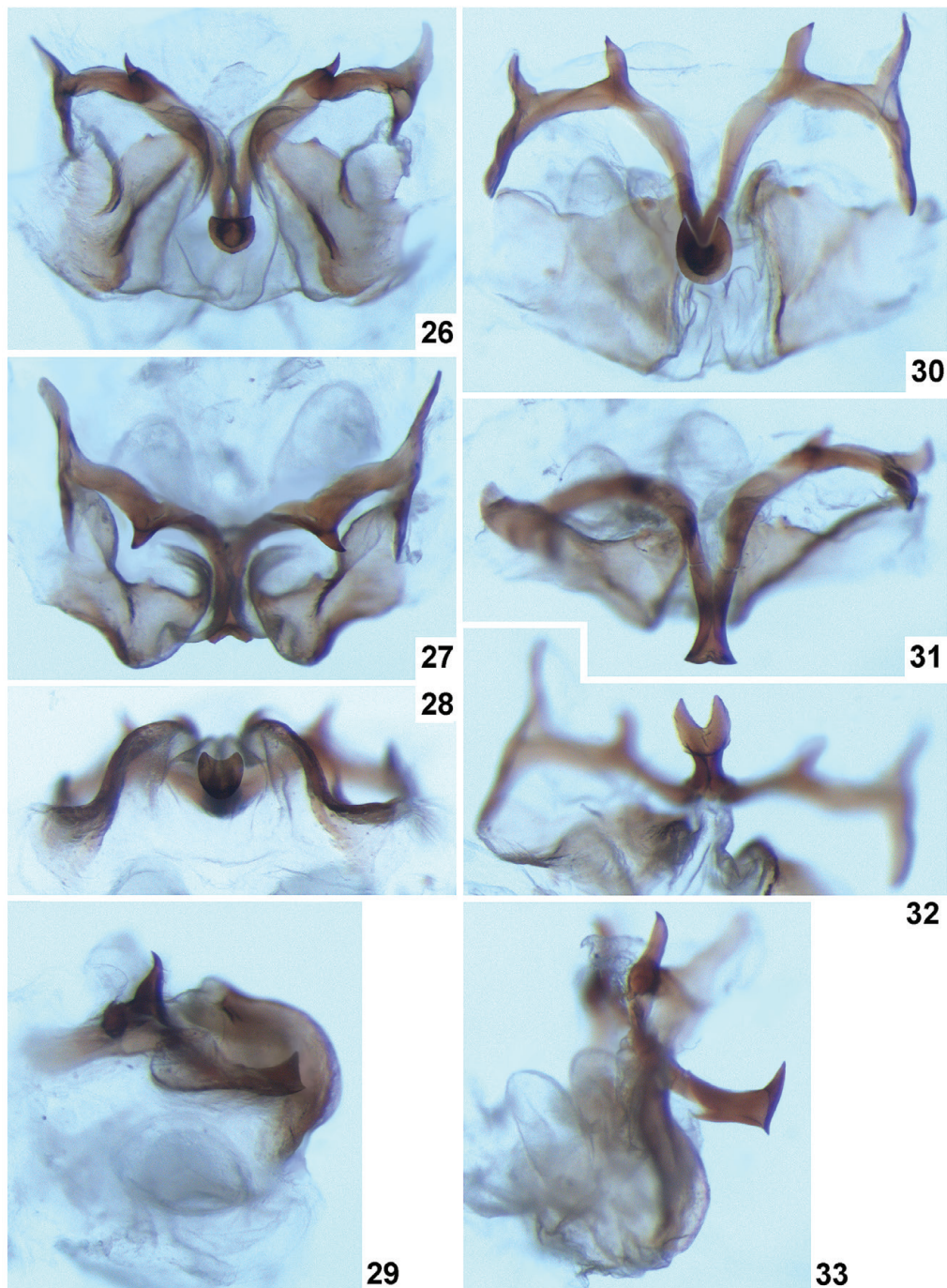
Remarks. This species is probably synanthropic or partly synanthropic. Such habits may explain its wide distribution: from Nossi Be I. near the western part of Madagascar to the eastern part of Madagascar (Toamasina Province).

***Malgasia seychellensis* sp. nov.**
(Figs 4, 14–17, 30–33)

Holotype. Male; **Seychelles**, Aldabra Group of islands, Assumption Island [Assumption Atoll], 12–14.VIII.1984, USSR Zoological Expedition (ZIN).

Paratypes. Six nymphs, same data as for holotype (ZIN); 1 nymph, same group of islands, Aldabra Atoll, South Island, Dune Jean-Louis, 13–20.III.1968, B. Cogan, A. Hutson (NHM); 2 nymphs, **Seychelles**, Farquhar Atoll, 16–19.VIII.1984, USSR Zoological Expedition (ZIN).

Description. Male (holotype). General appearance very similar to that of *M. marmorata* but with following differences: body with dark spots somewhat larger and slightly darker (however, rostrum of head almost dark brown with light central spot; Fig. 4); rostrum between antennal cavities slightly wider, approximately 1.2 times as



Figs 26–33. *Malgasia*, male: 26–29, *M. marmorata* (Sauss.) from Andasibe Vill.; 30–33, *M. seychelensis* sp. nov., holotype. Genitalia from above (26, 30), partly from above / partly in front (27, 31), from behind (28, 32), and from side (29, 33).

wide as scape; longest apical spur of hind tibia almost equal to half of hind basitarsus in length; genital plate less transverse and with widely rounded (almost obtusely angulate) distal part (Figs 14, 15). Genitalia also similar to those of *M. marmorata*, but their dorsal sclerite with somewhat longer median part having distinctly higher apical disc and much deeper dorsomedian notch of this disc (Figs 16, 17, 30–33).

Female unknown.

Nymphs practically indistinguishable from those of *M. marmorata*.

Length in mm, male. Body 7.8; pronotum 2.4; fore femora 5.2; hind femora 8.6; hind tibiae 9; hind basitarsi 3.5.

Comparison. The new species is most similar to *M. marmorata* but differs from the latter species in a slightly wider rostrum of the head, shorter inner middle apical spur of the hind tibia, less transverse and not truncate genital plate in the male, longer median part of the dorsal sclerite in the male genitalia, and clearly higher and more strongly notched apical disc of this sclerite. The new species is also similar to *M. comorana* Chopard, 1958 (Comores) in the shape of the dorsal sclerite in the male genitalia (with a pair of hooks and distinctly widened apical disc), but *M. seychellensis* is distinguished by a clearly smaller body, somewhat lighter colouration, and wider apical disc of the male dorsal genital sclerite having more acute (not widely rounded) dorsolateral lobules.

Etymology. The species is named after the Seychelles.

***Malgasia minutissima* sp. nov.**
(Figs 18–22, 35–38)

Holotype. Male; **Madagascar**, Toamasina Prov., Moramanga Distr., about 10 km towards NW from Andasibe Vill., Torotorofotsy Reserve, 1000 m, partly primary / partly secondary forest, on wall of high cavity in rotten stump, at night, 22.II–11.III.2013, A. Gorochov (ZIN).

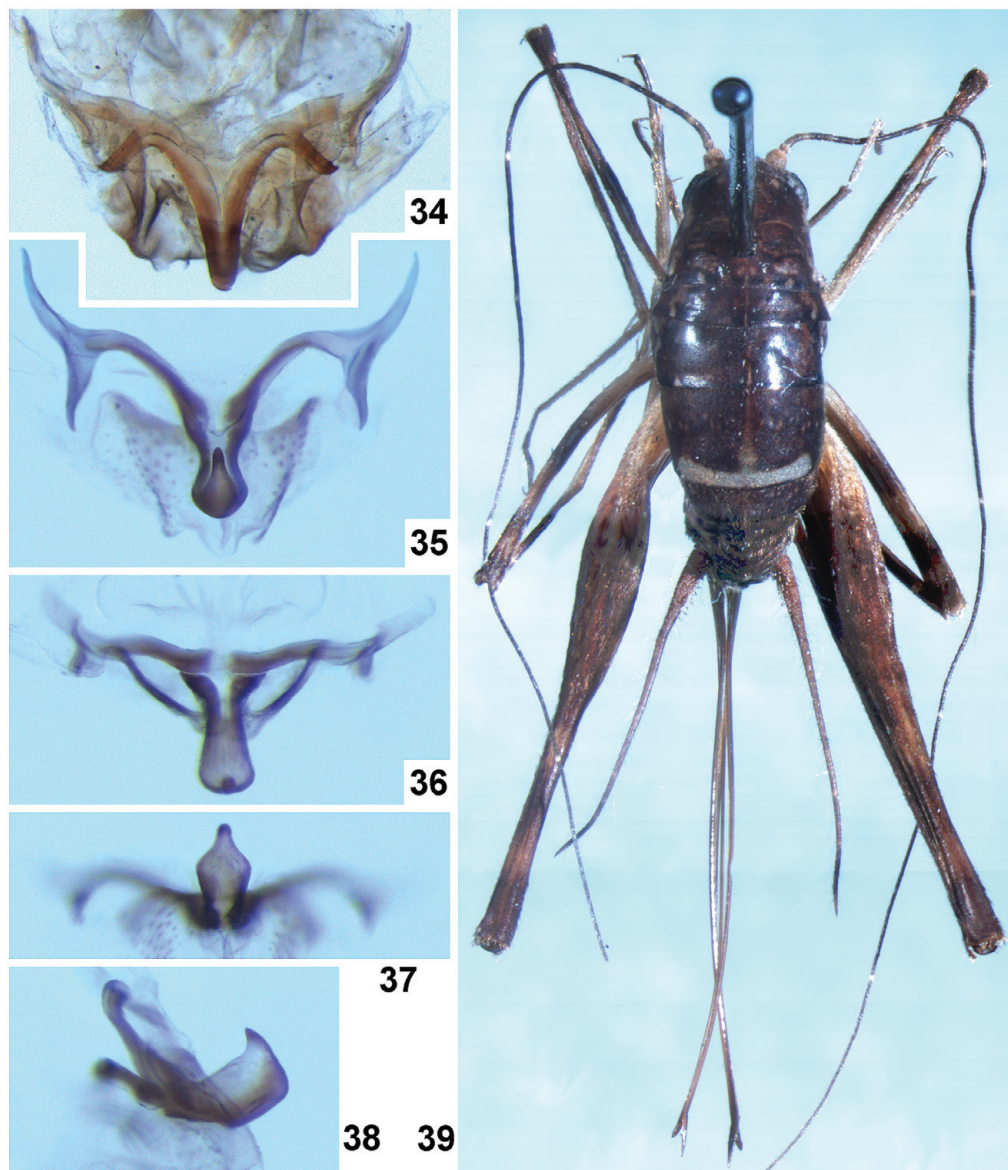
Paratypes. One male, 2 females, same data as for holotype (ZIN); 1 male, 2 females, 1 nymph, same province and district, but Analamazao-

tra Forest Station near Andasibe Vill., 18°56'S, 48°25'E, 900 m, secondary forest, on soil floor of wide cavity in rotten wood, at night, 8–20. III.2013, A. Gorochov (ZIN).

Description. Male (holotype). General appearance more or less similar to that of *M. marmorata* and *M. seychellensis*, however with following distinct differences: body very small (much smaller than in these species); colouration almost uniformly brown, but most part of eyes blackish, rest of epicranium, clypeus, large transverse area on pronotum, distal half of femora and most part of cerci slightly lighter, and antennae, rest of mouthparts and of legs, sternites, genital plate and cercal bases lighter (light brown, almost yellowish); eyes slightly wider than scape; rostrum between antennal cavities almost as wide as scape; pronotum approximately 1.3 times as wide as long; longest apical spur of hind tibiae somewhat shorter than half of hind basitarsus; last tergite with posterior lobe having obtusely angular notch at apex and V-shaped keel-like fold on dorsum (Fig. 18); epiproct almost round, with clearly concave dorsum (Fig. 18); genital plate similar to that of this species but slightly shorter (Figs 19, 20). Genitalia with dorsal sclerite somewhat similar to that of *M. marmorata* and *M. seychellensis* but lacking paired hooks and unpaired apical disc; median part of this sclerite rather high, narrowed in middle part, widened in subapical part, and with almost spine-like tubercle at apex (this tubercle directed more or less upwards; Figs 35–38).

Variations. Sometimes eyes brown, proximal half of tibiae weakly darkish, or body (including eyes) more or less uniformly light brown.

Female. General appearance as in male, but longest apical spur of hind tibiae slightly shorter in relation to hind basitarsus, and genital plate darkish. This plate also distinguished from that of female of *M. marmorata* by less transverse shape (ventral view), distinctly less projected dorsolateral lobes, and almost truncate hind edge (Figs 21, 22); ovipositor also similar to that of this species.



Figs 34–39. *Malgasia*, male: **34**, *M. chopardi* Gor., holotype; **35–38**, *M. minutissima* sp. nov., holotype; **39**, *M. grisea* sp. nov., holotype. Genitalia from above (34, 35), partly from above / partly in front (36), from behind (37), and from side (38); body of female from above (39).

Length in mm. Body: male 4.3–4.7, female 4.5–5; pronotum: male 1.4–1.6, female 1.5–1.7; fore femora: male 2.8–3, female 3–3.2; hind femora: male 4.9–5.2, female 5.3–5.5; hind tibiae: male 5.3–5.7, female 5.8–6.2; ovipositor 5.2–5.5.

Comparison. The new species differs from the most other congeners in the absence of paired hooks on the male dorsal genital sclerite (for comparison see Figs 6, 26, 30, 34, 35). From *M. decaryi* (Chopard, 1949) having a more or less similar dorsal

sclerite of the male genitalia, the new species is distinguished by the presence of two pairs (anterior and posterior) of the lateral projections on the above-mentioned sclerite (in *M. decaryi*, this sclerite is with only a pair of anterior projections); from *M. milloti* Chopard, 1949 and *M. singularis* Chopard, 1949, by the absence of processes on the male paraprocts; from *M. microphthalma* Chopard, 1951, by much larger eyes; and from *M. brevivalpis* Chopard, 1952 by uniformly coloured maxillary palpi and legs; and from *M. longipes* Chopard, 1949, by a much smaller body.

Etymology. This species name is the Latin word “minutissima” – smallest.

***Malgasia grisea* sp. nov.**
(Figs 23–25, 39)

Holotype. Female; **Madagascar**, Toamasina Prov., Moramanga Distr., Analamazaotra Forest Station near Andasibe Vill., 18°56'S, 48°25'E, 900 m, on bark of dry tree trunk lying on forest floor, at night, 8–20.III.2013, A. Gorochov (ZIN).

Description. Female (holotype). General appearance (Fig. 39) similar to that of *M. minutissima*, however body distinctly larger (but clearly smaller than in *M. marmorata* and *M. seychellensis*) and colouration with following peculiarities: head light brown with blackish eyes, a pair of short and narrow darkish vertical stripes on anterior part of dorsum, and brown antennae having lighter scape and sparse small light spots on flagellum; pronotum greyish brown with small lightish marks on disc and light brown lateral lobes having three darkened spots; other tergites, epiproct and paraprocts greyish brown with light brown small spots on lateral parts of meso- and metanotum as well as with wide transverse light spot along hind edge of first abdominal tergite; pleurites and legs light brown with brown spots; sternites, cerci, genital plate and ovipositor light brown. Structure of body very similar to that of female of *M. minutissima*, but scape almost 1.2 times as wide as rostrum between antennal cavities, pronotum approximately

1.1 times as wide as long, epiproct almost not separated from last tergite (Fig. 23), longest apical spur of hind tibiae approximately as in male of *M. seychellensis*, genital plate shorter and with more or less rounded hind part as well as almost without dorso-lateral lobes (Figs 24, 25), and ovipositor barely longer than hind femur.

Male unknown.

Length in mm, female. Body 7; pronotum 2.2; fore femora 5.1; hind femora 10; hind tibiae 11.5; ovipositor 10.3.

Comparison. The new species differs from the most other congeners in rather dark tergites; from *M. singularis* and *M. milloti*, in the absence of a tubercle-like convexity on the female last sternite (near its genital plate); from *M. brevivalpis*, in a larger body and not spotted maxillary palpi; from *M. decaryi* having somewhat darkened tergites, in a longer ovipositor (in *M. decaryi*, the ovipositor is distinctly shorter than the hind femur); and from *M. minutissima*, in a clearly larger body and in the other characters listed in the description.

Etymology. This species name is the Latin word “grisea” – grey.

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